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Curriculum Satisfaction in faculty of Medical Laboratory Sciences, Gezira University, Sudan: A Cross Sectional Study.

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Curriculum Satisfaction in faculty of Medical Laboratory Sciences, Gezira University, Sudan: A Cross Sectional Study. Nassir Abakar Babiker¹, Ali B. Habour², Inshirah M. A. Osman³, Adam Dawoud Abakar⁴, Mohamed H Ahmed⁵, Musaab Ahmed^{6,7}, Mohamed Elsheikh^{8,9}, Mugtaba Osman¹⁰, Ahmed AL Siddiq Shamsaldeen Ebraeem¹¹, Nadir Abuzeid^{12,13D*} - Omdurman Islamic University Journal-Sudan

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Abstract

Background: Using satisfaction to evaluate the performance of educational programs among students or alumni is now one of the most reliable and effective tools for enhancing program outcomes. This study aimed to evaluate program performance through undergraduate and

postgraduate students' satisfaction with the medical laboratory sciences curriculum faculty at the University of Gezira, Sudan.

Material and Method: A cross-sectional study with data gathered using a questionnaire covering three main sectors addressing satisfaction regarding curriculum.

Results: Overall, males were more satisfied with curriculum than females. In addition, undergraduates were significantly more satisfied with curriculum design than graduates and females.

Conclusion: The study concluded that males and undergraduates were more satisfied with curriculum than females and graduates.

Keywords: Medical laboratory sciences, Satisfaction, Curriculum Effectiveness, Research, Undergraduates, Graduates.

Introduction

Preparing medical laboratory personnel with good satisfaction toward the educational programme enables both the academic and services provider to gain high-performance outcomes regarding their role in society.

To achieve reliable and more discrete knowledge about how our educational program is going, the satisfaction of both undergraduate and postgraduate students is used as one of the assessment tools in many academics. (1–3). Satisfaction with the curriculum can be significantly affected by the quality of instruction methods, academic advising, skills acquisition, and preparation for competency in a career, with a high satisfaction rate found among female students (4). The level of satisfaction can also be increased when there is a perception among the teaching staff and students that their curriculum produces competent graduates; however, the teaching staff was more satisfied with the curriculum than the students (5).

Graduates' satisfaction with their curriculum is affected by many additional factors; job-related factors and continuing education of the laboratory personnel directly influence the perception regarding their career. Inappropriate education of laboratory personnel is very dangerous to the patient's health (6). Unfortunately, the unsatisfied laboratory personnel with their job caused bad feedback concerning the students' recruitment for such an education program (6–8). Therefore, recruiting and retaining graduates to work in a clinical laboratory remains a common challenge for health service providers (9). Furthermore, laboratory organizations will gradually lose highly

skilled, competent, and well-experienced employees as these workers often prefer more attractive and satisfying areas of employment (10). A study conducted at King Faisal University revealed that the students who choose to work on the bench in the lab of a hospital have more skills than those who want to continue their postgraduate studies as researchers or teachers (11). As a result of these findings, and in an attempt to reform the curriculum at King Faisal University. It was suggested that lab experience should be introduced early, relatively non-relevant and repeated subjects should be eliminated, ineffective instructional teaching methods should be stopped, and basic science subjects should be focused on besides clinical laboratory subjects (12).

The joint venture between Medical Laboratory Science at Kabul University of Medical Science (KUMS), Kabul, Afghanistan, in collaboration with the University of Rwanda (UR), Rwanda Biomedical Center (RBC), and National Reference Laboratory (NRL) in Rwanda concluded that; a significant shift of student satisfaction from practical "training" courses to theory courses after redesigning of laboratory instruction method to focus on understanding and performance of fundamental skills and techniques rather than specific diagnostic testing methods (13).

Early clinical exposure is a vital skill for medical laboratory sciences students. It also plays a crucial role in gaining the confidence of alumni in their professional practices (14). A study conducted in Ethiopia revealed that half of the respondents were satisfied with their clinical learning environment and curriculum (15).

Furthermore, using more modern tools in educational programs raises knowledge, which positively impacts student satisfaction. This was the case of a study conducted in Iran by Masoumeh Seidi and Fatemeh Amiri when they used virtual flipped classroom methods in instructional education (16).

Escaping of more medical laboratory graduates from their careers to change their jobs or shift to become a medical doctor. Also, some graduates are unsatisfied with their careers or, at some time, with no hope for continuous education. All those reasons trigger us to focus on and search for what causes this phenomenon.

Therefore, the study aimed to evaluate the satisfaction of students and alumni with the medical laboratory sciences curriculum in terms of design, delivery, and the research year at the faculty of medical laboratory sciences, University of Gezira, Sudan.

Material and methods

Study design and sampling technique:

This study was a descriptive cross-sectional study based on the respondents' perceptions. The population of this study included students in their final year from the Faculty of Medical Laboratory Sciences, Gezira University, and new graduates (technologists) working in the hospital laboratory of Obstetric and Gynecological Teaching Hospital, Gezira State, Sudan.

A convenient sample of 100 respondents, including 50 students and 50 new graduates of medical laboratory sciences, was collected using a probability sampling technique. A questionnaire containing demographic data of the respondents and optional choices on a three-point Likert scale ranging from agree to partially agree to disagree was used.

The questionnaire contained three sections concerning curriculum design, delivery, and final year.

Data collection and analysis:

The data was collected using a questionnaire that contained the respondents' demographic data and 53 variables covering curriculum, design, delivery, and research year.

The data was collected and analyzed using a factor and scale reduction technique to calculate satisfaction in the point system. Three main factors are categorized as primary specialization subjects, secondary subjects, and research-related subjects. The study was carried out in the most recent version of the medical laboratory sciences curriculum, updated in 2010 by the medical laboratory sciences faculty.

Ethical approval:

Ethical approval was obtained from the University of Gezira. The recruited respondents were informed about the study's importance in filling out the questionnaires, and some might refuse to participate.

Results

In this study, female respondents dominated graduate and postgraduate laboratory personnel (80 % in undergraduates, 66% in graduates). Most graduates were fresh between 2012 and 2018 (Table 1).

Table 1: Socio demographic variables

Factor	Undergraduate	Graduate
	Count (%)	count (%)
Gender		
Male	10 (20%)	17 (34%)
Female	40 (80%)	33 (66%)
Graduation Year		
2012	0 (0%)	7 (14%)
2015	0 (0%)	10 (20%)
2018	0 (0%)	33 (66%)
Academic Degree		
BSc	50 (100%)	28 (56%)
MSc	0 (0%)	22 (44%)
PhD	0 (0%)	0 (0%)

Curriculum design:

Regarding satisfaction with curriculum design, there was a significant interaction between the group and the gender factors. Female undergraduates were more satisfied with curriculum design than female graduates, unlike graduates where males were more satisfied with curriculum design ($P = 0.006707$). Overall, males were more satisfied with curriculum design than females by 7.3316 points ($P = 0.001067$), and undergraduates were more satisfied with curriculum design than graduates (by an average of 4.6727 points, $P = 0.007524$). Year of graduation and academic degree (BSc, MSc, PhD) were not significantly influenced in terms of satisfaction with curriculum design (Table 2).

Table 2: satisfaction with curriculum design.

	Estimate	SE	t value	P
Undergraduate Group	4.6727	1.7113	2.7306	0.007524 **
Male Gender	7.3316	2.1724	3.3748	0.001067 **
Group × Gender Interaction	-9.3316	3.3673	-2.7712	0.006707 **
Year2015	6.9267	4.5521	1.5217	0.1351
Year2018	1.1081	4.1233	0.2687	0.7894
MSc Degree	1.4780	2.8608	0.5167	0.6079

Curriculum delivery:

There was a significant interaction between the group and the gender factors. Female undergraduates were more satisfied with curriculum delivery than female graduates were, but male graduates were more satisfied with curriculum delivery than male undergraduates were ($P = 0.002128$). Overall, males were more satisfied with curriculum delivery than females by 3.7148 points ($P = 0.013394$). Year of graduation, group, and Academic degree had no significant impact on satisfaction with curriculum delivery (Table 3).

Table 3. Satisfaction with curriculum delivery

	Estimate	SE	t value	P
Undergraduate Group	1.60303	1.16131	1.3804	0.170680
Male Gender	3.71480	1.47427	2.5198	0.013394 *
Group × Gender Interaction	-7.21480	2.28512	-3.1573	0.002128 **
Year2015	2.0205	2.8219	0.7160	0.4777
Year2018	-1.7817	2.5561	-0.6970	0.4894
MSc Degree	-2.0967	1.7734	-1.1823	0.2433

Final year research curriculum;

Regarding satisfaction with the final year research curriculum, the group gender interaction was not statistically significant (P = 0.37176). Overall, males were more satisfied with the final year research curriculum than females by 2.12478 points (P = 0.01001). Year of graduation, group, and Academic degree not significantly affected in terms of satisfaction with final year of research, Table 4.

Table 4. Satisfaction with final year research curriculum

	Estimate	SE	t value	P
Undergraduate Group	-0.25758	0.63698	-0.4044	0.68684
Male Gender	2.12478	0.80864	2.6276	0.01001 *
Group × Gender Interaction	-1.12478	1.25339	-0.8974	0.37176
Year2015	2.29377	1.44407	1.5884	0.1192
Year2018	-1.47546	1.30804	-1.1280	0.2653
MSc Degree	-1.44615	0.90752	-1.5935	0.1180

Scale reduction analysis ;

In order to further make a more in-depth understanding of the distribution of satisfaction with the 22 subjects at hand, we performed a factor analysis. We fitted 3 factors of the data set based on the visualization of the scree plot of the principal component analysis (Table 5, Figure 1)

The first factor," primary specialization subjects ", is loaded on Clinical Experience, Anatomy, histopathology, parasitology, clinical chemistry, haematology, computer, instrument, Ethics, and microbiology.

The second factor is" research-related subjects": loaded on by research, Quality Control, basic skills, statistics, medical physics, and genetics.

The third factor," secondary subjects," is loaded on by Enough Practice, physiology, pharmacology, biochemistry, Embryo, and pathology.

We compared the different factors head-to-head in terms of satisfaction level. We summed up the components of each element and standardized them by dividing them by the number of component subjects. The mean satisfaction for the primary subjects was 1.333413 (SD = 3.567) and 2.336667 (SD = 1.008933) for the secondary subjects, while it was 2.453333 (SD = 1.042874) for the research subjects. The satisfaction with the primary subjects was superior to that of the secondary or research subjects.

Interpretation of factor analysis results:

Clearly, the first and third factors consist of clinically related subjects, whereas the second factor consists mostly of research-related subjects.

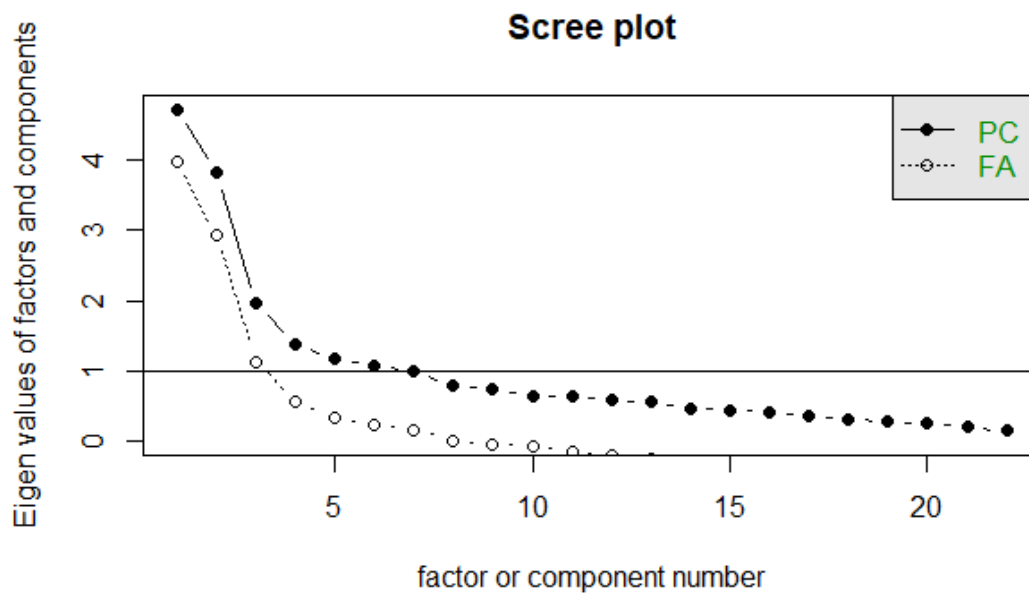


Figure 1; scree plot of the principal component analysis

Table 5. The 3-factor results for the factor loadings are as follows:

	Factor1	Factor2	Factor3
Clinical Experience	0.289	0.119	
Enough Practice			0.503
Anatomy	0.548	-0.269	0.219
physiology	0.384		0.579
pharmacology	-0.450	0.396	0.508
pathology	0.291	0.279	0.488
microbiology	0.385	0.389	0.356
Histopathology	0.532	0.181	0.145
parasitology	0.694		
research		0.691	
Genetics	0.270	0.293	
Quality control	0.197	0.563	0.343
biochemistry		0.253	0.634
clinical chemistry	0.533	0.440	-0.117
haematology	0.794	-0.131	-0.424
basic skills		0.574	0.113
statistics	0.132	0.667	0.136
computer	0.538		0.130
instrument	0.562		
medical physics	-0.111	0.549	0.125
Embryo	-0.298	0.396	0.495
Ethics	0.322	0.221	0.120

Further Analysis;

We sought to compare the different factors head-to-head in terms of satisfaction level. We summed up the components of each factor and standardized them by dividing them by the number of component subjects (Figure 2).

The mean satisfaction for the primary subjects was 1.333413 (SD = 3.567)

The mean satisfaction for the secondary subjects was 2.336667 (SD = 1.008933)

The mean satisfaction for the research subjects was 2.453333 (SD = 1.042874)

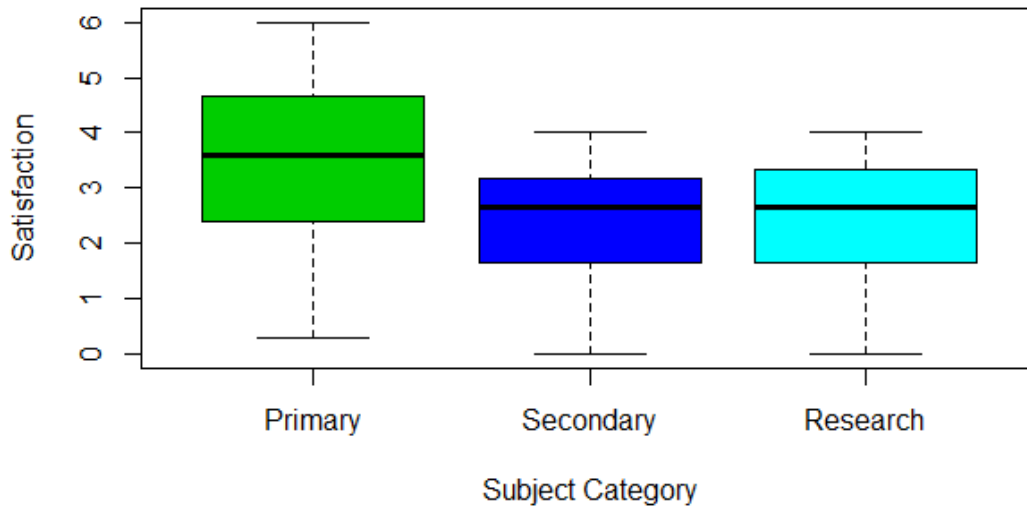


Figure 2; The subjects component.

T test was used to compare subject categories head-to-head;

Clearly satisfaction with primary subjects was superior to satisfaction with secondary or research subjects, (Table 6);

Table 6; T test to compare subject categories.

Subject	Primary	Secondary	Research
Primary		t = 7.358 p-value = 5.958×10^{-12}	t = 6.5788 p-value = 4.617×10^{-10}
Secondary	t = 7.358 p-value = 5.958×10^{-12}		t = -0.80402 p-value = 0.4224
Research	t = 6.5788 p-value = 4.617×10^{-10}	t = -0.80402 p-value = 0.4224	

Discussion:

This is the first study targeting medical laboratory students and graduates to evaluate their satisfaction with their school curricula in Sudan. Female undergraduates were significantly more satisfied with the curriculum design and delivery than the graduated females. In contrast, graduated males were considerably more comfortable than male undergraduates with the curriculum design and delivery ($P = 0.006707$) and ($P = 0.00212807$), respectively. Wiesner et al. showed that satisfaction with the curriculum design regarding the primary specialization subjects, their related secondary subjects, and research skills mainly depended on whether the curriculum covered enough practical training courses and tools that enabled the trainee to gain fundamental skills and techniques 14. Motivating students to raise their satisfaction level regarding the curriculum is a big challenge affecting the graduates' continuing careers as researchers or even teaching staff. One of those is the method of curriculum delivery, which requires activities that must be carried out in the field (in-service training in hospital laboratories), data searching on the internet, and research. Therefore, these issues significantly affect satisfaction rates due to the lack of proper program implementation. That happened in the study held at King Faisal University when the students preferred working as bench workers at the hospital to continue their postgraduate study as researchers or teachers 12, 13. Furthermore, early clinical exposure and the subject's relevance to the educational goals concerning curriculum in the first year have an excellent effect on student and alum satisfaction 13, 15. In addition, males were significantly more satisfied in the final research year than females by 2.12478 points ($P = 0.01001$); this might be due to the massive efforts needed to conduct good research, which could negatively affect female satisfaction.

The study conducted in the USA showed that gender affects curriculum satisfaction, and this finding is similar to ours: Female students were more satisfied with the curriculum 4,5.

After using a scale reduction analysis of the collected data, 22 subjects had the highest effect on satisfaction rates. We performed a factor analysis of three factors that fit. These three factors consisted of primary specialization subjects, research-related subjects, and secondary subjects. Furthermore, after applying a T-test to compare subjects' categories head-to-head, it was clear that primary subjects had superior satisfaction than secondary and research-related subjects. The lower rate of satisfaction with the secondary subjects and research-related subjects, as our study revealed, might negatively affect the students and graduates in their careers that the case resulted in some authors, as some medical laboratory technologists, feeling satisfaction regarding their careers and

seeking another job rather than working in medical laboratory field 7, 8,9,11. Therefore, the faculty of medical laboratory sciences should focus on secondary and research-related subjects to raise the satisfaction of undergraduate students and graduates.

One limitation of the study is the small number of students recruited; therefore, a large sample size in future studies may provide a more accurate assessment of student's satisfaction with the curriculum. It will also be more effective if such studies are done in other laboratory colleges with similar curricula. Despite these limitations, the study is novel and the first of its kind in Sudan and reflects how students were satisfied with the curriculum of the medical laboratory college.

Conclusion:

This study shed light on the importance of secondary subjects (raising the level of in-service practices, Physiology, Pharmacology, Biochemistry, Embryology, and Pathology) and research-related subjects (Research et al.) for both students and graduates of medical laboratory science. Hence, more focus should be given to the faculty of medical laboratory sciences to raise the satisfaction of students and graduates. Satisfaction regarding these subjects requires strong efforts concerning curriculum redesigning, delivery, and the research-related subject in the final year and how they could be implemented.

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References:

1. Ten Eyck RP, Tews M, Ballester JM. Improved Medical Student Satisfaction and Test Performance With a Simulation-Based Emergency Medicine Curriculum: A Randomized Controlled Trial. *Ann Emerg Med.* 2009;54(5):684–91.
2. Witowski LL. The relationship between instructional delivery methods and student learning preferences: What contributes to student satisfaction in an online learning environment? *Diss Abstr Int A, Humanit Soc Sci.* 2008;69(5-A):1–152.
3. Jamelske E. Measuring the impact of a university first-year experience program on student GPA and retention. *High Educ.* 2009;57(3):373–91.
4. Tessema MT, Ready K, Yu WW. Factors A ffecting College Students’S atisfaction with Major Curriculum: Evidence from Nine Years of Data. *Int J Humanit Soc Sci.* 2012;2(2):1–44.
5. Abdelsalam M, Rodriguez TE, Brallier L. Student and Faculty Satisfaction with Their Dental Curriculum in a Dental College in Saudi Arabia. *Int J Dent.* 2020;2020.

6. Brayfield AH, Crockett WH. Employee attitudes and employee performance. *Psychol Bull.* 1955;52(5).
7. Onuoha AR, Abdulla FA. Professional and Career Satisfaction of Physical Therapy Graduates from Kuwait University. *Physiother (United Kingdom).* 1991;77(4).
8. Gvazdinskas LC, Maffetone MA. Quality management series. Employee satisfaction: An integral component of total quality. Vol. 9, *Clinical Laboratory Management Review.* 1995.
9. Stuart JM, Utz R. Does this job fit? Clinical rotations as “tryouts” for students. Vol. 21, *Clinical Leadership and Management Review.* 2007.
10. Bernice J, Teixeira R. Mentorship: A Successful Tool for Recruitment, Recognition, and Advancement. *Clin Leadersh Manag Rev.* 2002;16(6).
11. Bashawri LAM. Professional attitudes and career choices of female medical laboratory technology students and graduates: experience from eastern saudi arabia. *J Family Community Med.* 2005;12(3).
12. Bashawri L, Alhameed M, Ahmed M, Alqurashi AR. Curriculum reform and the future direction of the Medical Laboratory Technology program. *Bahrain Med Bull.* 2007;29(2):61–3.
13. Wiesner SM, Conway-Klaassen J, Joya M, Mwikarago EI, Porta CM. An International Project for Curriculum and Faculty Professional Development in Medical Laboratory Science Downloaded from. *Am Soc Clin Lab Sci.* 2019;
14. Imamwerdi BW. The Effects of Early Clinical Exposure On Medical Laboratory Technology Students : Its effect on Internship Period and their professional Carrier. 2012;1–13.
15. Temesgen Ayenew¹, Adane Fentie Tadesse, Tsinunat Fikru, Mihretie Gedfew, Haile Amha, Mamaru Getie Fetene, Afework Edmealem, Addisu Getie¹, Setarg Ayenew Birhanie and Mengistu Abebe Messelu, Satisfaction of medical and health science students with their clinical learning environment and its determinant factors at Debre Markos University, northwest Ethiopia Ayenew et al. *BMC Medical Education* (2024) 24:11 <https://doi.org/10.1186/s12909-024-06114-6>
- 16 Masoumeh Seidi and Fatemeh Amiri, Evaluation of Knowledge, Skill and Satisfaction Level of Laboratory Sciences Students in Pre-laboratory Immunohematology Course Using Med Edu. January-December (2024) ; 23(1): e145 <https://doi.org/10.5812/jme-145773> Virtual Flipped Classroom